
Kathy Prestridge—Physics' solutions for energy independence

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Solving physics' greatest mysteries

Turbulence is the most important unsolved problem of classical physics.

That is how fellow Princeton grad and renowned Los Alamos physicist Richard Feynman described it, which Kathy Prestridge is dedicated to understanding.

When most people hear the word “turbulence,” they think of the erratic airflow that disrupts their air travel. But turbulence influences a lot more than that: impacting the flow and boundaries between liquids and gases—from the benign mixing of cream in a cup of coffee to pollution dispersed in oceans and across the atmosphere.

Harnessing the power of the sun

Fluids are ubiquitous, and understanding fluid dynamics can improve how we design our automobiles or even our nuclear reactors. Tackle turbulence and its hold on the charged gas called plasma, and practical fusion reactors could become a reality.

At Los Alamos National Lab, Prestridge leads the Physics Division's Extreme Fluids Team that performs high-resolution experiments to study fluid dynamics and better understand mixing transition and turbulence. Applications include weapon design, astrophysics and inertial confinement fusion (ICF)—the power of the sun.

Featured on the cover of [*Journal of Fluid Mechanics*](#) a few months ago, Prestridge and colleagues took first-time measurements of shock-driven turbulent mixing, providing physical insights that support more accurate modeling. Understanding turbulence and being able to accurately simulate ICF implosions could substantially impact the nation's future energy independence.

A vibrant mix

In college at Princeton and then U.C. San Diego where she obtained her doctorate, Prestridge studied applied mechanics and aerospace engineering. At Los Alamos, she researches the behavior of materials in extreme conditions, in addition to turbulence and mixing.

A busy mother who is grateful for the support of her scientist husband, Ben Sims, Prestridge also leads seminars for women that help them develop skills and tactics to achieve their goals in challenging professional environments.

"Do something that is interesting, but your career doesn't have to define you," she tells future scientists.

No "mad scientists" here

"The town of Los Alamos can be a very intimidating environment for a young scientist or engineer," adds Prestridge. "STEM fields need people with different perspectives who are great at their jobs but are also able to communicate their ideas. Don't fall into believing the 'mad scientist' stereotype."

Fitting advice from a woman who was recently named one of the Lab's Women Who Inspire for her support of a dynamic and positive, collaborative team.

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